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SOIL CONSERVATION DIGEST NO. 10, 1936. \*

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SOCIAL CONSERVATION SERVICE

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### PINTO LAKE CCC ENROLLEES FIGHT FIRES

Enrollees from the Pinto Lake CCC Camp of the Corralitos Soil Conservation Service demonstration area have just passed through a very hazardous and busy fire season. During June, July, August, and September, they were almost continuously on the fire lines. The fires came at such close intervals and the boys had worked so hard on previous fires that, at times, it was necessary to call for volunteers. There was never defection in the ranks and if fifty men were needed, the first fifty called off the roster volunteered. Approximately 15,000 man-hours were spent on fire duty in this period.

Ten Fires  
Fought

Ten fires were fought, which burned over 275,000 acres, ranging from a two acre fire which lasted one hour to the Gilroy Hot Springs-Gustine fire, which raged for almost three weeks, burning an area of around a quarter of a million acres. Enrollees from Pinto Lake spent eight days battling this inferno.

Trained Fire  
Fighters

CCC enrollees are a trained force of fire-fighters and they have done much to reduce the loss from grass, brush, and forest fires. Fires are not only destructive to vegetation, but to the soil as well. A burned-over watershed is the prey of wind and rain, nothing is left to protect soil, that has been thousands of years in the making, from erosion.

Officials  
Praise  
Enrollees

Forest Service officials, army officers, Camp Superintendent Gleason, and camp foremen, were enthusiastic in their praise of the morale of the enrollees under such trying conditions. The boys obeyed orders implicitly and without complaint. As a result of experience gained in fighting these fires, Floyd Jones, an enrollee, was given a position by the State Division of Forestry.

Other Camps

Enrollees from other CCC Camps have also done their part in fighting fires this summer.



TILLAGE OF LAND FOR EROSION CONTROL  
By C.E. Ahlson, Regional Agronomist

Proper and timely tillage is an important factor in the control of soil erosion. Fields from which crops have been harvested this season may enter the winter rainy months without adequate vegetative cover to retard the water and hold the soil. On such land, plowing to leave the land in a roughened condition, subsoiling to cause penetration of water into the soil, listing, which creates a series of parallel furrows, will be helpful in retarding the run-off and in a majority of cases be necessary to prevent a loss of the rich top soil from the cropping areas.

Listing  
Machines

More recently, a great deal of thought has been given to types of implements best suited for tillage of the land. In the middle west listing machines have been used for several years. The parallel furrows from 6 to 12 inches deep have been especially effective in checking wind erosion and soil washing following the heavy rains. If the furrows were not plowed on the absolute contour (level), the water would run to the lowest point and break through, causing serious washing and resultant gullies.

Hole Digger

About two years ago a hole digging machine was constructed. This machine had a series of shovels attached to a cam shaft working on an eccentric which lowered and raised them, gouging holes in the soil surface. This method held the water in these pockets and proved effective if the rainfall did not exceed the capacity of the small reservoirs.

Damming Lister

The size of the holes made by this machine was not sufficiently large to facilitate extensive use. The furrows made by a listing machine had a larger capacity, so the result was the development of a damming lister which automatically collected enough dirt in the furrow to create a check or dam at spaced intervals in the furrow. This machine actually created a continuous series of basins on the slopes. These reservoirs impounded the water and it gradually penetrated the soil.



An ingenious mechanic in southern California has developed a very simple lister of the disk type. The disks are used to make the furrows and disks attached to a long straight arm hinged at their connection to the lister frame, or the furrowing machine, effectively creates the dams.

Damming  
LISTER  
Furrows

The operation of the damming attachment is very simple. The disks, which fit the cross section of the furrow, drag in the furrow collecting loose dirt in front of them. A touch of the power lever will lift the disks, leaving the furrow effectively blocked with a pile of loose dirt. The dams can be spaced as desired. Those blocked furrows will prevent the flow of water in the furrow. The furrows, spaced 32 inches apart and made  $\frac{1}{4}$  to  $1\frac{1}{4}$  inches deep, will retard the run-off from a heavy rain.

By holding the water in these furrows all or most of it will gradually penetrate the soil. The type of soil will largely determine the rate of penetration.

This listing machine, with or without the damming attachment, has been used for several years by orchardists in the citrus groves of Southern California to turn under cover crops and make furrows for irrigation.

Lister used  
in Southern  
California

Damming Lister  
to be  
Demonstrated

The effective and simple operation of this damming lister promises an extended use of the machine. The Soil Conservation Service, Region 10, California and Nevada, will be operating several machines this fall to determine the degree of slope and type of soil on which the operations will prove most effective. These demonstrations will be conducted on several of the Soil Conservation Projects, and field meetings will be held in conjunction with the demonstrations.

Re-listing  
of Field

In case there is a heavy volunteer growth previous to the time the fields should be worked for the spring crop, the field can be re-listed, thus destroying the weeds and maintaining the furrows for subsequent rains. Ordinarily the farmer cultivates after each rain to conserve moisture and kill weeds. The damming lister can be used to replace other implements and re-listing will not only destroy weeds but maintain furrows for late spring rains.



Listing may prove an effective operation on the sub-soiled areas after the first or second heavy rain during the fall or winter months.

Increased  
Yields

Proper tillage methods and cropping practices, together with other soil conservation measures, will increase and promote the storage of water in the soil and result in increased yields. Many reports are available showing the increased returns from soil and water conservation practices.

A very good example which records the value of contour listing for pasture improvement is reported by the Experiment Station at Spur, Texas. An effort was made to increase by natural means the stand of native grass on poor pastures and to increase further the carrying capacity of these pastures that already had a fair-to-good stand of grass.

Increased Yield  
on Pasture Land

A five acre block was listed on May 5, 1934 to a depth of 3 inches with a two row lister with plows set 39 inches apart. Harvesting was done by hand in July 1935 in such a manner as to simulate close grazing. The yield on the listed land was at the rate of 2,423 pounds of air-dried grass per acre and on an adjoining unlisted area of similar size the yield was 857 pounds per acre. The listed area held all the rainfall, which permitted it to penetrate into the soil. The yield was approximately tripled merely by furrowing or listing the field.

On many clean-cultivated areas in California the damming lister can be used to advantage in retarding runoff and storing more moisture in the soil. It can also be used to supplement or replace other types of implements now used.

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There are now 29 voluntary soil conservation associations in the Region - 6 in Nevada and 23 in California.



THE VALUE OF COOPERATION  
By M. Montgomery, Senior Foreman, Camp Chester  
English Hills Project

Cooperation is the basis of the soil conservation work. The agreements between the Soil Conservation Service and the farmers are of a cooperative nature; the Service cooperates with other agencies which are engaged in related types of work, and there is close cooperation between the various divisions within the Service.

Necessity for Cooperation

The situation in the CCC Camps offers a striking example of the necessity for cooperation. The enrollees are under the supervision of the Soil Conservation Service during their working hours and are taken care of by the Army during the rest of the time. The two organizations are represented in each camp by the camp superintendent and the camp commander, respectively.

Camp Commander and Camp Superintendent

When the camps were first established the relationship between the two services was worked out by the individual representatives in each camp. As time went on, however, there gradually grew up a set of regulations which incorporated the best of the early plans. At the present time these regulations cover many of the problems, but it is by cooperation between the camp commander and camp superintendent that the minor difficulties which arise from day to day are settled and the efficiency of the camp maintained.

Health of CCC Enrollees Watched

The camp commander, representing the Army, provides the enrollees with clothing suited to the weather and the type of work being done. By issuing raincoats, boots, and warm clothing during the cold rainy weather, the commander keeps the men in a physical and mental health which makes for the best work. The provision of good food and proper sanitary conditions in the camp have a direct effect on the health and morale of the enrollees and a consequent effect on the progress of the work in the field.

Safety of Men in Field

The camp superintendent is responsible for the safety of the men in the field. In addition to planning the work so as to avoid exposing the men to unnecessary hazards, he must see that they are instructed in and made to practice safe methods of handling themselves on the job and on the trucks which carry them to and from work. The close super-



vision of the enrollees provides an excellent opportunity to instill in them a lasting regard for common rules of safety.

Vocational  
Experience

The work in the field also provides practical experience in a large variety of unskilled and skilled occupations. The technical staff teaches the enrollees how to do the job and thus supplements the more formal educational work which the Army carries on with the enrollees during their evening hours.

Value of  
Cooperation

These few examples, selected at random from a large number, indicate the value of cooperation between the two services. This cooperation does much to assure the success of the Soil Conservation program, to achieve erosion control, and of the CCC ideal, to turn out men physically and mentally qualified to meet the requirements of their future employers and thus establish for themselves a permanent place in industry.

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#### AUSTRALIAN SEES BENCH-TERRACES IN VENTURA COUNTY

Bench-Terracer

Bench-terraced citrus orchards in the Las Posas Soil Conservation Service demonstration project in Ventura County attracted the attention of W. A. T. Summerville, Brisbane, Australia, when he visited the area recently. This type of terrace is being effectively used in curbing soil washing. Summerville is with the Department of Agriculture of the territory of Queensland and has been in this country a year studying American horticulture. On his tour of the Las Posas he was accompanied by Martin R. Huberty, associate irrigation engineer, University of California, Riverside, and several Soil Conservation Service officials.



LA HABRA PROJECT  
By Leonard R. Wohlotz, Assistant Regional Head,  
Section of Conservation Surveys

Project Location

The La Habra Project was authorized July 23, 1936. It is located about 25 miles southcast of Los Angeles and has an area of 25,000 acres, lying partly in the south central portion of Los Angeles County and in the northeastern corner of Orange County. Headquarters for the project are at Whittier, situated immediately outside the western boundary of the area. The area is highly developed and readily accessible by excellent highways.

Principal Crops

The principal crops grown in this area are citrus, avocados, walnuts, grain hay, and beans. Although the agricultural development on the bottom lands and more gentle slopes dates back many years, the development of the steeper slopes has occurred chiefly since 1920. The steep slopes and elevated benches have the most uniform and moderate temperatures while the level bottom lands are subject to frequent damaging frosts. This has had a very important influence on the agricultural development of this area and accounts for the extensive avocado development on the steep slopes of the Puente Hills, where air drainage is excellent, generally making it unnecessary to use orchard heating for avocados and other sub-tropical fruit.

Avocados on Steep Slopes

Steep slopes ranging mainly from 25 to 40 percent in the La Habra Heights and North Whittier Heights sections have recently been developed to avocados. The land has been subdivided into small farms (averaging about 5 acres) having a high value as home sites.

Winter Cover Cropping Practiced

In general the farmers of the area are very progressive and are now using many of the better known practices for controlling erosion on steep orchard land. Contour planting on bench terraces, contour cultivation, and winter cover cropping are generally practiced.

Need for Terrace Outlets

In the La Habra Heights and North Whittier subdivisions sheet erosion is largely controlled on slopes up to 50% by bench terracing and cover cropping but considerable damage results from the failure to provide suitable terrace outlets along the property boundaries. Active gullies occurring in many of the natural drainageways now serve as terrace outlets for several small farms and can only be controlled by a program involving all the farms in the unit watershed.



On the flat bottom lands of the North Whittier Heights citrus district, a serious problem exists due to the lack of suitable storm ditches to remove the runoff from areas above. During heavy storms gullying is active on the upper part of the fan and the eroded material is deposited on the more gentle slopes below.

Sheet and  
Gully Erosion

Sheet and gully erosion are severe on the grain land south of Otterbein, where slopes ranging from 10 to 35 percent are planted annually to oats and barley which are harvested for hay. The land is also frequently pastured after the crop is removed. This system of cropping and pasturing has reduced the organic content of the soil and constitutes an important cause of the present erosion conditions.

Land values in general are high, but vary a great deal depending on location and possibilities of future development.

APPROXIMATE EXTENT OF THE VARIOUS EROSION CLASSES  
IN THE LA HALA PROJECT

	<u>APPROX. PERCENT</u>
Slight sheet erosion	11
Slight sheet erosion and occasional gullying	4
Moderate sheet erosion	15
Moderate sheet erosion and occasional gullying	25
Moderately severe sheet erosion	17
Moderately severe sheet erosion and occasional gullying	23
Severe sheet erosion & occasional gullying	5
	<u>100</u>

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"Under agreements between farmers and the Soil Conservation Service, there are scheduled for construction during the next 3 years more than 36,000 miles of farm terracing, or enough to make 1½ terraces from New York to Los Angeles." - SOIL CONSERVATION, August 1936.



## ULTIMATE SURVIVAL

By Fred W. Herbert, Regional Nurseryman

The above title words may well be kept constantly in mind as representing a basis upon which our planting program may be guided along safe and sane lines. The idea expressed by these two words also serves to tie in the nursery work closely with that of the other plant-life divisions. The number of plants or tons of seed that may be hauled out of the nurseries and planted each year are not, in any sense, a measure of the success of the nursery work or the vegetative program. It is the ultimate survival of this material on the areas that counts.

### Ultimate Survival of Plant Material is Goal

If the highest possible ultimate survival of this plant material is kept in mind as a goal by all individuals having to do with the plant work, complete cooperation will naturally follow. For ultimate survival of the plants does not depend on any single factor, or the work of any individual or division. The Nurseries Division should furnish the best possible planting stock and to do so it should be familiar with the use of the plant material, the areas on which it is to be planted, the economic factors affecting the kind of stock to be supplied. This takes the nurseries into the Agronomy and Woodland Management fields. Those divisions, in turn, in order to intelligently specify what the nurseries shall raise, must be familiar with problems of raising seedling plants.

### Economic Factors

The economic factors are also closely related to ultimate survival. In an analysis of expense based on actual accomplishments, all the costs must be borne by the plants that finally survive, because these plants are all that we have left to show for the work. If ultimate survival is fifty percent, the costs are doubled; if twenty-five percent, the costs are quadrupled. Our success with plants, therefore, all the way from starting them in the nurseries to their use for actual vegetative control of erosion on the areas, and particularly including the economic factors, is measured by ultimate survival, and ultimate survival depends to a large extent upon the interest, intelligence and cooperation that takes place in the plant work all along the line.



Choice of Plants

The choice of plants to be used for soil erosion control has a very direct relation to ultimate survival. So far as natural, or uncultivated, areas are concerned, the safest guide in selection of plants is to "follow nature." In Region 10 the most striking feature of the climate is the long season of drought, from April or May to October. During this period there is practically no rainfall. The Woodland Management and Agronomy Divisions, therefore, are "following nature" in specifying from the nurseries drought-resistant shrubs, trees and grasses - species that are either native or long-established exotics. These species are able to survive because of specialized drought-resistant characteristics, such as deep roots, very low transpiration, moisture-storing abilities, etc. The economical production of large quantities of these plants in the nurseries, however, requires the substitution of artificial conditions - shade, summer watering, confining roots to limited areas and depths, pruning of roots or tops when transplanting, etc.

Transplanting

To what extent may we go "contrary to nature" in the nursery and still provide stock that will stand transplanting? This general question involves such nursery problems as size of stock and length of root necessary for both potted and bare-root plants, withholding water from the plants in the fall, "hardening" plants to resist possible early frosts after they are transplanted, proper timing of nursery production, etc. These questions cannot be answered in a single season, especially as no nursery technique has been previously worked out for many of these species. They are, however, receiving special attention and study. Progress in solving those problems is made with each season's experience, resulting in improved nursery practices and contributing materially to a high ultimate survival of the plants.

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Illustrated lectures on soil conservation were given at 11 CCC Camp meetings during August, the total attendance being 700.

